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TECHNICAL REPORT ONRL-67-67

MARINE SCIENCES IN BULGARIA

By JOHN D. COSTLOW, Jr.

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MARINE SCIENCES IN BULGARIA

This report on the marine sciences in Bulgaria will be short, not necessarily because little is being done or planned, but rather because during both of my visits there there seemed to be a general reluctance on the part of senior scientists to provide an outline of research interests and plans, to give detailed information on scientific personnel and their fields of interest, and to generally discuss basic scientific research in the manner to which I have become accustomed from visiting scientists in most other European countries.

Although there are two laboratories on the Bulgarian coast of the Black Sea, one at Varna and the other at Burgas, I was able to visit the former only. The Research Institute of Fisheries and Oceanography, Varna (which for a period up until 1957 was identified as "Stalin"), occupies a delightful location adjacent to the Black Sea in this industrial port of approximately 100,000 people. The building, constructed in 1917 for other purposes, was originally the marine laboratory of the University of Sofia. Most of the ground floor is occupied by the public aquarium and natural marine museum. The offices of the scientists are located on the second floor, and presumably, those laboratories which exist are also located there.

Under the present administrative scheme, the Institute comes under the supervision of Prof. A. Valkanov of the Institute of Zoology and Museum, Sofia, within the Bulgarian Academy of Sciences. The man who actually directs the research of the Institute, however, is Mr. L. Ivanov, who is approximately 48 and is an ichthyologist. Unfortunately he speaks no English. He has been involved in a number of studies on the general biology of some of the fish which are of commercial importance to Bulgaria. He did not disclose any immediate or long range plans for research or further development of the Institute.

A second member of the staff is Mr. K. Bulgurkov, perhaps in his mid fifties. He speaks English quite well and was most helpful as an interpreter in conversations with other members of the staff. His research has been largely concerned with crustaceans, including several studies on Astacus, but he has also been involved in studies on food and distribution of the turbot, the internal parasites of this commercially important fish, and general faunistic surveys of molluscs along the Bulgarian coast of the Black Sea. He recently collected one adult, male blue crab, Callinectes sapidus, in the waters close to Burgas and is becoming extremely interested in the biology and commercial applications of this crab which is so important along the Atlantic coast of the US.

Mme. V. Petrova, approximately 37, is interested in a number of aspects of phytoplankton. She has published quite extensively, including several papers dealing with speciation, distribution, and seasonal cycle of phyto-

plankton in the Black Sea. In the Spring of 1966 she spent several months in Israel working with Prof. M. Shilo at the Hebrew University of Jerusalem on the toxic algae Prymnesium parvum. This species has been collected in the Black Sea, and Petrova hopes to continue her studies, expanding them to include experiments on the toxic compounds contained within the algae. She also has an interest in initiating a study of primary productivity, using C^{14} , and, although it was indicated that the equipment was available for such experiments, it was never shown to me. Petrova has worked and published with a colleague at Constantza, Mr. H. Skolka, and she presented a paper at the CIESMM meetings in Bucharest in October 1966.

A fourth member of the staff, Mr. I. Dimov, has been interested in zooplankton of the Black Sea. He has been involved in general studies of occurrence and abundance, seasonal variations, and the way in which fluctuations in zooplankton abundance may be associated with fluctuations in the commercial fisheries of Bulgaria. He expressed considerable interest in references pertaining to the use of the brine shrimp, Artemia, as a food for commercially important fish and other marine animals under conditions of artificial culture. The brine shrimp occurs in tremendous numbers in the shallow bays and lagoons along portions of the Bulgarian coast, and it is apparent that ways are being sought to utilize them for commercial purposes. Dimov does not speak English.

Mme. V. Kaneva-Abagjjeva, who speaks only Bulgarian, is working on the benthos of the Bulgarian coast. Her work has included studies on the relative abundance of individual species including amphipods, the interrelationships which appear to exist, certain aspects pertaining to fouling animals, and efforts to determine the biomass which is represented by the different species within this group of bottom animals.

The only other member of the staff that I met was Mr. A.V. Rojdestvensky, the hydrographer of the Institute. He speaks no English, and thus it was through Mr. Bulgurkov and Mme. Petrova that I learned of his interest in chemistry of the Black Sea. The chemical constituents of this body of water differ considerably from "sea water," and Rojdestvensky has been making a general long-term study of these differences, the distribution of certain constituents, and seasonal variations which may occur.

In looking over the publications from the Institute, the names of other authors would suggest that I did not meet all of the staff. It is possible, however, that some of them are associated with the Fisheries Laboratory at Burgas and publish in the common journal. "The Proceedings of the Research Institute of Fisheries and Oceanography" has been published annually since 1957, although the original title was "Bulletin - - - - -." Virtually all of the papers are in Bulgarian, and until recently, the abstracts were limited to Russian and/or French. In 1966, the Bulgarian title-page began to be accompanied by an English title-page, and English abstracts for many of the papers are now common. Volume VII, just published for 1966, has 352 pages and contains 15 articles which range in subject matter from the

distribution of zoobenthos in the Black Sea to a consideration of the use of herbicides in the control of aquatic vegetation in fish breeding ponds and natural reservoirs.

Although the staff of the Institute apparently have limited contacts with westerners, they do have associations with Romanian and Russian scientists. During the summer of 1967, one of the oceanographic research vessels of the Academy of the USSR spent approximately one month at Varna, giving a course in oceanographic equipment and techniques. Mme. Petrova, in addition to her visit to Israel, has visited laboratories in France, but most of the other members of the staff have not ventured into the free-world for some time. The library, while containing many of the European journals and classical references, had very few from the UK or the US.

The equipment and facilities of the Institute, judging from what little I saw, are limited, and none of the more specialized equipment associated with physiological or biochemical studies was evident. During my visit in October 1966, a decision was made by the appropriate ministry of the Government to initiate planning for an oceanographic program, including improved shore facilities at Varna and an oceanographic vessel. One year later it was not possible to discuss these plans or development, and the only reference to them was that they were "proceeding slowly."

At the Institute of Zoology in Sofia, several of the staff are also interested in marine animals. Prof. A. Valkanov, although working largely with freshwater animals, has published on marine algae and produced a catalog of Black Sea fauna in 1957. He understands some English but does not speak the language, thus my conversations with him were largely through Mme. Valkanov. At approximately 63, it may be expected that his responsibilities will be taken over by other members of the staff within the next few years. Mr. L.J. Cvetkov, approximately 49, has done some work with fishes of the Black Sea, and published a book (in Bulgarian) several years ago on this subject. I understand that he is currently completing a volume which will give detailed descriptions for the fauna of the Bulgarian coast. He also has published some papers on the zooplankton of this area.

In Bulgaria one is painfully aware of what happens to science, as well as to certain other aspects of life, in the vacuum which is imposed by the government. Apparently Bulgaria does not belong to any international scientific organizations (IOC, SCOR, IUBS, CIESMM), and thus only knows of their programs and plans from information that is passed along by colleagues from neighboring countries. Although most of the scientists would welcome exchange and active participation in such programs, they are keenly aware that although a change in policy may come in time, for the present their only role in those programs which involve cooperation with western scientists is limited to correspondence.

RECENT PUBLICATIONS

1. Bulgurkov, K., 1965. On the food and distribution of the commercial turbot, Rhombus maeoticus (Passal) in the southern part of the Bulgarian Black Sea coast. Proc. Res. Inst. Fish. and Oceanog., VI: 99-109 (Bulgarian with English summary).
2. Bulgurkov, K., 1963. On the biology of the tapeworm Bothriocephalius scorpii (Muller) in turbot. Proc. Res. Inst. Fish. and Oceanog., III: 253-264 (Bulgarian with English summary).
3. Dimov, I., 1966. Zooplankton on the western shores of the Black Sea in the period of 1960-64. Proc. Res. Inst. Fish. and Oceanog., VII: 45-68. (Bulgarian with English summary).
4. Dimov, I., 1965. Certain quantitative correlations between the zooplankton and sprat (Sprattus sprattus sulinus (Antipa)) in the Black Sea, off the Bulgarian coast. Proc. Res. Inst. Fish. and Oceanog., VI: 49-62. (Bulgarian with English summary).
5. Ivanov, L.S., 1966. On the biology of the Black Sea mackerel (Scomber scombrus L). Proc. Res. Inst. Fish. and Oceanog., VII: 97-134. (Bulgarian with English summary).
6. Ivanov, L.S., 1965. Modeling the formation and utilization of the stock of carp (Cyprinus carpio L.) in basins where they have been artificially bred. Proc. Res. Inst. Fish. and Oceanog., VI: 5-19. (Bulgarian with English summary).
7. Kaneva-Abagjjeva, V. and T. Marinov, 1966. Distribution of the zoobenthos in the sand biocenosis of the Bulgarian Black Sea coast. Proc. Res. Inst. Fish. and Oceanog., VII: 69-94. (Bulgarian with English summary).
8. Kaneva-Abagjjeva, V. and T. Marinov, 1965. Fouling organisms along the Bulgarian Black Sea coast. Proc. Res. Inst. Fish. and Oceanog., VI: 137-144. (Bulgarian with English summary).
9. Petrova, V.J., 1965. Sur le phytoplancton de la Mer Noire devant le littoral Bulgare. Comm. int. Explor. sci. Mer Medit., Rapp. et P.V., XVIII: 357-361. (French).
10. Petrova, V.J., 1965b. Verbreitung und massenhafte Entwicklung der giftigen Chrysomonade Prymnesium parvum Carter in den Seen an der Bulgarischen Schwarzmeerküste. Zeit. Fisch. Hilfswissenschaften, XIV: 9-14. (German with English summary).
11. Rojdestvensky, A.V., 1966. Chimie des eaux du large de la Mer Noire devant le littoral Bulgare. Proc. Res. Inst. Fish. and Oceanog., VII: 5-28. (Bulgarian with French summary).

12. Rojdestvensky, A.V., 1965. Caractéristique hydrochimique des eaux de la Méditerranée et de la Mer Noire pendant le mois de décembre 1963. Proc. Res. Inst. Fish. and Oceanog., VI: 145-150. (Bulgarian with French summary).
13. Valkanov, A., 1964. Untersuchungen über Prymnesium parvum Carter und seine toxische Einwirkung auf der Wasserorganismen. Kieler Meeresf., XX: 65-81.
14. Valkanov, A., 1964. Nachtrag zum katalog der Bulgarischen schwarzmeer-fauna. Bull. Inst. Zool. Musee, XVII: 51-59.

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The report gives a brief account of marine sciences at the Research Institute of Fisheries and Oceanography, Varna and the Institute of Zoology, Sofia with notes on some of the staff and their research interests. ()

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